We claim:

1. An apparatus comprising:

- at least a first and a second electrical signal input having at least:
  - a first output providing a first optical signal characterized by a first carrier wavelength, wherein the first optical signal corresponds to a first electrical signal; and
  - a second output providing a second optical signal characterized by a second carrier wavelength that is different than the first carrier wavelength, wherein the second optical signal corresponds to a second electrical signal;
- an optical correlator that receives at least the first and second optical signal and that has an output at least simultaneously comprising:
  - a first correlation result optical signal that corresponds to an amount of correlation between the first optical signal and a correlation reference; and
  - a second correlation result optical signal that corresponds to an amount of correlation between the second optical signal and the correlation reference.

2. The apparatus of claim 1wherein the optical correlator comprises optical correlator filter means for filtering the first and second optical signals as a function, at least in part, of the correlation reference.

3. The apparatus of claim 2 wherein the correlation reference comprises a reference signal signature.

4. The apparatus of claim 3 wherein the reference signal signature comprises a code division multiple access despreading code.

5. The apparatus of claim 1 and further comprising a flat lens having unity transmittance and that is disposed optically upstream of a Fourier lens disposed between the first and second electrical signal input and the first and second output.

6. The apparatus of claim 5 and further comprising at least one Fourier distorter disposed between the Fourier lens and the optical correlator.

7. The apparatus of claim 6 wherein the at least one Fourier distorter comprises at least one of:
- a fixed distortion parameter Fourier distorter;
- a dynamically alterable distortion parameter Fourier distorter.

8. The apparatus of claim 1 and further comprising at least one Fourier distorter disposed optically subsequent to the optical correlator.

9. The apparatus of claim 8 and further comprising at least one Fourier lens disposed optically subsequent to the at least one Fourier distorter.

10. The apparatus of claim 1 and further comprising a multiple wavelength photodetector array disposed optically subsequent to the optical correlator.

11. The apparatus of claim 1 and further comprising at least:
- a first radio frequency antenna that facilitates provision of the first electrical signal; and
- a second radio frequency antenna that facilitates provision of the second electrical signal.

12. A method comprising:
- providing at least a first electrical signal and a second electrical signal;
- converting the first electrical signal into a corresponding first optical signal having a first carrier wavelength and an intensity that corresponds, at least in part, to a characteristic of the first electrical signal;
- converting the second electrical signal into a corresponding second optical signal having a second carrier wavelength that is different than the first carrier wavelength and having an intensity that corresponds, at least in part, to a characteristic of the second electrical signal;
- simultaneously optically correlating a reference signal with each of the first optical signal and the second optical signal.

13. The method of claim 12 wherein providing at least a first electrical signal and a second electrical signal comprises receiving a first and second wireless transmission via a first and second antenna, respectively, and providing the first and second electrical signal as a function, at least in part, of the first and second wireless transmission, respectively.

14. The method of claim 12 wherein converting the first electrical signal into a corresponding first optical signal comprises simultaneously converting a plurality of temporally differentiated samples of the first electrical signal into a corresponding plurality of temporally differentiated first optical signals.

15. The method of claim 14 wherein converting the second electrical signal into a corresponding second optical signal comprises simultaneously converting a plurality of temporally differentiated samples of the second electrical signal into a corresponding plurality of temporally differentiated second optical signals.

16. The method of claim 15 wherein converting the first electrical signal into a corresponding first optical signal and converting the second electrical signal into a corresponding second optical signal comprises simultaneously passing the plurality of temporally differentiated first optical signals and the plurality of temporally differentiated second optical signals through at least a first Fourier lens to provide a first and second Fourier transformed optical signal.

17. The method of claim 16 wherein converting the first electrical signal into a corresponding first optical signal and converting the second electrical signal into a corresponding second optical signal further comprises distorting at least one of the first and second Fourier transformed optical signals to provide at least one distorted Fourier transformed optical signal.

18. The method of claim 17 wherein distorting at least one of the first and second Fourier transformed optical signals comprises distorting at least one of the first and second Fourier transformed optical signals to thereby facilitate accurately correlating the optical signal that is distorted to the reference signal.

19. The method of claim 12 wherein simultaneously optically correlating a reference signal with each of the first optical signal and the second optical signal comprises providing a first correlation output signal as a function, at least in part, of how closely the first optical signal correlates to the reference signal and a second correlation output signal as a function, at least in part, of how closely the second optical signal correlates to the reference signal.

20. The method of claim 19 wherein the reference signal comprises a Fourier representation of a time-based signal.

21. The method of claim 19 and further comprising distorting at least one of the first and second correlation output signals to provide a distorted correlation output signal.

22. The method of claim 21 and further comprising converting the distorted correlation output signal out of the Fourier domain to provide a resultant correlation output signal.

23. The method of claim 22 and further comprising converting the resultant correlation output signal from an optical carrier to a corresponding electrical carrier.

24. A code division multiple access radio receiver comprising:
- a plurality of antennas;
- at least a first despreading code;
- a multiple wavelength optical correlator that is operably coupled to the plurality of antennas and the first spreading code.

25. The code division multiple access radio receiver of claim 24 wherein the multiple wavelength optical correlator comprises an emissive multiple wavelength spatial light modulator having an input operably coupled to the plurality of antennas and having a plurality of optical output signals, wherein each of the optical output signals has a carrier wavelength that is unique to a given one of the antennas.

26. The code division multiple access radio receiver of claim 25 and further comprising a substantially flat lens having unity transmittance and that is disposed optically upstream of a Fourier lens having an optical input disposed to receive the plurality of optical output signals and an output providing corresponding Fourier domain optical output signals.

27. The code division multiple access radio receiver of claim 26 and further comprising a first Fourier distorter having an optical input disposed to receive the Fourier domain optical output signals and an optical output that provides distorted Fourier domain optical output signals.

28. The code division multiple access radio receiver of claim 27 and further comprising an optical correlator filter having an optical input disposed to receive the distorted Fourier domain optical output signals and an optical output that provides a correlation result optical output signal for each of the plurality of optical output signals.

29. The code division multiple access radio receiver of claim 28 and further comprising a second Fourier distorter having an optical input disposed to receive the correlation result output signals and an output that provides corresponding Fourier domain de-distorted correlation result optical output signals.

30. The code division multiple access radio receiver of claim 29 and further comprising an inverse Fourier transformation lens having an optical input disposed to receive the Fourier domain restored correlation result optical output signals and an optical output that provides restored correlation result optical output signals.

31. The code division multiple access radio receiver of claim 30 and further comprising a multiple wavelength photodetector array having an optical input disposed to receive the restored correlation result optical output signals and an output comprising electrical signals that individually correspond to restored correlation result optical output signals for each of the plurality of antennas.

32. A method comprising the steps of:
- providing electrical signals comprising at least a first and a second set of data wherein each of the sets of data comprises temporally dispersed data elements;
- simultaneously converting:
    - each of the electrical signals that comprise the first set of data into corresponding first optical signals having a common first carrier wavelength;
    - each of the electrical signals that comprise the second set of data into corresponding second optical signals having a common second carrier wavelength, which second carrier wavelength is different than the first carrier wavelength.

33. The method of claim 32 wherein simultaneously converting further comprises proximally grouping the optical signals as a function of the temporal correspondence of the data elements that correspond to the optical signals, such that optical signals of the first and second optical signals that correspond to data elements that represent a substantially common point in time are grouped together.

34. The method of claim 33 wherein providing electrical signals comprising at least a first and a second set of data further comprises providing electrical signals comprising at least a first and second set of data wherein each of the sets of data comprises at least twelve temporally dispersed data elements.

35. The method of claim 33 wherein providing electrical signals comprising at least a first and a second set of data further comprises providing electrical signals comprising at least a first and second set of data wherein each of the sets of data corresponds to a transmission as received by an antenna, such that the first set of data corresponds to a transmission as received by a first antenna and the second set of data corresponds to a transmission as received by a second antenna.

36. The method of claim 33 wherein providing electrical signals comprising at least a first and second set of data wherein each of the sets of data corresponds to a transmission as received by an antenna, such that the first set of data corresponds to a transmission as received by a first antenna and the second set of data corresponds to a transmission as received by a second antenna further comprises providing electrical signals comprising at least a first and second set of data wherein each of the sets of data corresponds to a transmission as received by an antenna, such that the first set of data corresponds to a transmission that comprises a first spreading code as received by a first antenna and the second set of data corresponds to the transmission as received by a second antenna.

37. A method of preparing optical data for correlation in a spectral domain with a correlation reference, comprising the steps of:
- receiving a plurality N of sets of optical signals representing spectral domain representations of a plurality N of sets of temporally distributed data elements, wherein each of the plurality N of sets of optical signals has a unique carrier wavelength as compared to others of the plurality N of sets of optical signals;
- optically distorting at least some of the optical signals to normalize the spectral domain representations with respect to the correlation reference.

38. The method of claim 37 wherein optically distorting further comprises using an optical pathway having fixed pathway characteristics.

39. The method of claim 38 wherein optically distorting further comprises using an optical pathway having at least one dynamically alterable pathway characteristic.

40. The method of claim 39 wherein using an optical pathway having at least one dynamically alterable pathway characteristic further comprises automatically adjusting the at least one dynamically alterable pathway characteristic to thereby normalize the spectral domain representations with respect to the correlation reference.

41. A method of preparing optical data for comparison with a comparison reference, comprising the steps of:
- receiving a plurality N of sets of optical signals representing a plurality N of sets of data elements, wherein each of the plurality N of sets of optical signals has a unique carrier wavelength as compared to others of the plurality N of sets of optical signals;
- optically distorting at least some of the optical signals, as a function at least in part of the unique carrier wavelength, to normalize the optical signals with respect to the comparison reference.